

CLAIMS

1. A method for purifying an oxygen containing gas comprising radiating ultraviolet rays to the oxygen containing gas in the presence of a photocatalyst comprising 5 titanium oxide.

2. The method according to claim 1 wherein the method comprises a first step for generating ozone in the oxygen containing gas, a second step for further radiating ultraviolet rays of a medium wavelength of 200 nm or longer, 10 but shorter than 300 nm to the gas treated in the first step to form active oxygen, and a third step for still further radiating ultraviolet rays of a long wavelength of 300 nm or longer, but shorter than 380 nm to the gas treated in the second step to convert said active oxygen into oxygen 15 molecule in ground state, at least said second and/or third step being conducted in the presence of a photocatalyst.

3. The method according to claim 2 wherein said first step is a step for radiating ultraviolet rays of a short wavelength of shorter than 200 nm to the oxygen containing 20 gas.

4. The method according to any one of claims 1 to 3 wherein said photocatalyst comprises particles of titanium oxide supporting, as an electrode, fine particles of another metal.

5. The method according to any one of claims 1 to 4 wherein 25 said photocatalyst comprises particles of titanium oxide of an orthorhombic crystal system, or particles of titanium oxide of an orthorhombic crystal system supporting fine

particles of another metal.

6. The method according to claim 5 wherein said particles of titanium oxide of an orthorhombic crystal system are particles of brookite.

5 7. The method according to claim 2 or 3 wherein the method further comprises a step for irradiating the oxygen containing gas treated in said third step, with rays radiated from an infrared lamp and with rays radiated from a halogen lamp to dry the gas.

10 8. The method according to any one of claims 1 to 7 wherein said oxygen containing gas is an air.

9. An apparatus for purifying an oxygen containing gas comprising a first treating room having means for supplying the oxygen containing gas and a device for generating ozone 15 in the supplied oxygen containing gas, a second treating room connected to the first treating room and having a device for radiating ultraviolet rays of a medium wavelength of 200 nm or longer, but shorter than 300 nm, a third treating room connected to the second treating room and having a device for 20 radiating ultraviolet rays of a long wavelength of 300 nm or longer, but shorter than 380 nm, and means for discharging the oxygen containing gas treated in the third treating room outside the apparatus, said second and/or third treating room having a photocatalyst comprising titanium oxide.

25 10. The apparatus according to claim 9 wherein said device for generating ozone is a device for radiating ultraviolet rays of a short wavelength of 110 nm or longer, but shorter

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than 200 nm.

11. The apparatus according to claim 9 or 10 wherein said photocatalyst comprises, as particles of photo-semiconductor, particles of titanium oxide supporting, as an electrode, fine particles of another metal.

12. The apparatus according to claim 9 or 10 wherein said photocatalyst comprises particles of titanium oxide of an orthorhombic crystal system, or particles of titanium oxide of an orthorhombic crystal system supporting fine particles of another metal.

13. The apparatus according to claim 12 wherein said particles of titanium oxide of an orthorhombic crystal system are particles of brookite.

14. The apparatus according to claim 9 wherein said third treating room is further provided with a drying room wherein a portion for irradiating the oxygen containing gas treated in the third treating room, with rays from an infrared lamp and a portion for irradiating the oxygen containing gas treated in the third treating room, with rays from a halogen lamp are installed in order.

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